Amendments to the Specification:

Please replace the paragraph beginning at page 2, line 2, with the following rewritten paragraph:

Dosimeters have been known for over five decades. (See Day, M. et al., Nature 1950; 166:146-147 ~~166:141-147; Andrews, H., Rev. Sci. Instrum. 1957; 28:329-332;~~ Day, M., Phys Med Biol. 1990; 35:1605-1609; Hoecker, F. and Watkins, I., Int J Appl Rad Iso. 1958; 3:31-35~~; Audet, C. and Schreiner, L. in: Proc. Soc. Mag. Res. Med. 10th Annual Scientific Meeting, 1991, 705~~). The radiochromic effect and its chemical mechanisms have been studied as a means of radiation dosimetry (see McLaughlin, W.L., Trans. Am. Nucl. Soc. 1968; 11:460; McLaughlin, W.L. and Kosanic, M., Int. J. Appl. Radiat. Isot. 1974; 25:249; McLaughlin, W.L. et al., Riso Report M-2202, Riso National Lab., Roskilde, Denmark, 1979; Kosanic, M.M. et al., Int. J. Appl. Radiat. Isot. 1977; 28:313; Bobrowski, K. et al., J. Phys. Chem. 1985; 89:4358.). Previously it was shown that radiation can be monitored by exposure of two-dimensional films, plates, or flat composites made from, inter alia, photographic emulsions (silver halide on cellulose and advancements on this art: Becker, K., Solid State Dosimetry, CRC Press, Cleveland, Ohio, 1973, pp. 231-237 ~~Chapter 6~~), thermoluminescent materials (lithium fluoride formulations and advancements on this art, McKinlay, Thermoluminescence Dosimetry, Chapter 4, Adam Hilger Ltd., 1981), phosphate glass, phosphor-containing materials, gels or films containing radiochromic dyes (McLaughlin, W. et al., Radiat. Phys. Chem 198; 18:987-989). Sunlight dosimeters have been described, see Petkov, I. ~~Pethor, I. And~~ and Nunzi, J. in Third Internet Photochemistry and Photobiology Conference, November 24 – December 24 2000; ~~Diffey, B. in Radiation Measurement in Photobiology, Academic Press, 1989;~~ Diffey, B. Photochem. Photobiol. 1994 ~~Photobiol., 1997~~; 60:380-382; Parisi, A. et al., Phys. Med. Biol., 1997; ~~42:7788~~ 42:77-88; Diffey, B. et al., Br. J. Dermatol., 1997; 97:127-130; Rahn, R. and Lee, M., Photochem. Photobiol. 1998, 68:173-178. ~~Photobiol.,1994; 22:59-66~~.

Please replace the paragraph beginning at page 2, line 24, with the following rewritten paragraph:

Examples of "reporter compounds" of the invention. Leuco dyes are defined herein as compounds which undergo a structural change: 1) upon the absorption of penetrating radiation, or 2) by the action of a local decrease in pH brought about by the liberation of H+ ions caused by the absorption, by the medium or by an added activator molecule, of penetrating radiation, or 3) or by the action of radical species generated by the absorption of radiation by the medium or by an added activator molecule. The structural change gives rise to a corresponding change in one or more optical properties of the leuco dye. The change or changes in optical properties can be, but is not limited to, a shift in the absorption spectrum in the IR or the UV-visible range, for example such that the "leuco" or starting structure is colorless and the radiation-transformed structure is colored; or the induction of fluorescence or phosphorescence. Examples of leuco dyes are photochromic dyes, radiochromic dyes, pH-indicating dyes, and radiographic dyes. Leuco dye systems are well known in the literature. Leuco dyes in their reduced leuco form, when properly chosen, can form the basis of color image forming systems. Radiographic imaging based on crosslinking of organic molecules by absorbed radiation has been described (Kosar, J., Light-Sensitive Systems, Wiley, New York, 1965; pp. 158-193, ~~Dorian, G.H. and Wiebe, A.F., Photochromism, The Focal Press, London, 1970; Brown, G.H., ed., Photochromism, Wiley-Interscience, New York, 1971;~~ MacLaughlin, W.L., in Manual on Radiation Dosimetry, Holm, N. and Berry, R., eds., Dekker, New York, 1970, pp. 129-177). Use of tetrazolium dyes in radiographic imaging in colloids and aqueous gels has been reported (~~Gierlach, Z.S. and Krebs, A.T., Am. J. Roentgenol. Radium Ther. 1949; 62:559-563; Krebs, A.T., in Encyclopedia of X-rays and Gamma Rays, Clark, G.L., ed., Reinhold, New York, 1963, pp. 274-276~~; Zweig, J.I. et al., Cancer Treatment Rep. 1977; 61:419-423). Leuco dye systems are further discussed in ~~The Theory of the Photographic Process, 3rd edition, Mees and James, pp. 283-4, 390-1, Macmillion Co., N.Y.~~ Kosar's Light Sensitive Systems, pp. 367, 370-380, 406, (1965), Wiley and Son, Inc., N.Y.; and Chemistry and Applications of Leuco Dyes R. Muthyala, ed., (1997), pp. 1-3, 47-53, 67-74, 97-98, 125-127, 159-162, 207-208 Plenum Press, N.Y. Leuco dyes in solution have been used for dosimetry (Farahani, M. et al., Appl. Radiat. Isot. (Int. J. Radiat. Appl. Instrum. Part A) 1990; 41:5-11. Leuco dyes have been

incorporated in polymer films and evaluated as two-dimensional dosimeters: Sidney, L.N. et al., Radiat. Phys. Chem. (Int. J. Radiat. Appl. Instrum., Part C) 1990; 35:779-782; Khan, H.M. et al., Radiat. Phys. Chem. (Int. J. Radiat. Appl. Instrum., Part C) 1991; 38:395-398; and U.S. Patent Nos. 2,936,276; 3,370,981; 3,609,093; 3,710,109; 3,743,846; 3,903,423; 4,829,187; and 5,117,116. Films containing dyes or dye precursors have been employed as routine dosimeters for food irradiation, sterilization of medical products, and radiation processing (MacLaughlin, W.L. in Sterilization by Ionizing Radiation, Gaughran, R. and Goudie, A., eds., Multiscience, Montreal, Vol. I, 1974; Humphries, K. and Kantz, A. Radiat. Phys. Chem. 1977; 9: 737; Kantz, A. and Humphries, K., Radiat. Phys. Chem. 1979; 14: 575). Leuco dyes in organic solvents have been irradiated using halocarbons as_activators. See MacLachlan, A., J. Phys. Chem. 1967; 71:718-722; Miyaji, T., et al., J. Photopolym. Sci. Technol. 2001; 14:225-226; UK Patent Application GB 2182941A). pH-Indicating dyes have been admixed with polyvinyl chloride to produce polymers which give a color reaction upon irradiation due to HCl liberated by a radiolytic process (U.S. Patent Nos. 3,743,846 and 3,899,677; Ueno, K., Radiat. Phys. Chem. 1988; 31:467-472). Leuco dyes formulated with photo acid generators in solvent systems have also been described. See Tokita, S., et al., J. Photopolym. Sci. Technol. 2001; 14:221-224.

Please replace the paragraph beginning at page 4, line 28, with the following rewritten paragraph:

Another approach to the fabrication of a 3D dosimeter uses the employment of aqueous gels containing materials to interact with incident penetrating radiation to give species which could later be detected and quantified. Dosimeters containing ferrous salts ("Fricke solution") have been utilized in mapping penetrating radiation (Fricke, H. and Hart, E. "Chemical Dosimetry" in Radiation Dosimetry Vol. II, Chapter 12, Attix, F. et al. ~~and Roesch, W., eds~~ ed., Academic Press, New York, 1966). Aqueous gels containing Fricke dosimeter solution in combination with magnetic resonance imaging (MRI) techniques have been disclosed (Gore, J. C., et al., Phys. Med. Biol. 1984; 29:1189-1197; ~~Gore, J. C., et al., Mag. Res. Imaging 1984; 2:244~~). In this approach, the radiation-induced oxidation of ferrous to ferric ions in solution could be detected by a change in the

water proton spin relaxation times, T1 and T2, and the changes were large enough to be mapped with high spatial resolution by MRI when the Fricke solution was dispersed in a gelatin or agarose gel. (Gore, J. C., et al., Mag. Res. Imaging, 1984; 2:244; Schulz, R. J., et al., Phys. Med. Biol. 1990; 35:1611-1622). A similar dosimeter based on ferrous sulfate and agarose gel was described. (See Olesson et al., Appl. Radiat. Isot. 1991; 42:1081-1086; Appleby, A. and Leghrouz, A., Med. Phys. 1991; 18:309-312.) Some disadvantages associated with the use of this approach are the rapid diffusion of oxidized ions resulting in an inherent limitation to stability and resolution of the image, the necessity for relatively high dose rates and long radiation times, and unpredictable behavior in small volumes.

Please replace the paragraph beginning at page 5, line 18, with the following rewritten paragraph:

New Fricke systems with improved diffusion parameters have been developed. (See Chu, K et al., Phys. Med. Bull. 2000; 45; 955-969.) Reviews of MRI-mediated dosimetry are provided in MacDougall ND, et al., Phys Med Biol. 2002; 47(20):R107-21 and in McJury, M. et al., Br. J. Radiol. 2000; 73(873):919-29.